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14. ABSTRACT

Information superiority is a capability present today and expected to continue in the future. This capability provides information at faster rates increasing situational awareness, enhancing information sharing, and increasing the speed of decision making. The advantages of this information rich environment are not optimized because the users of information reside in an industrial age organizational structure. The command and control function within the organization is addressed. This paper defines effective command and control elements and applies these terms to recent military operations. The solutions to similar C2 problems from the corporate world are analyzed. Finally, the paper evaluates the examples and concludes a smaller and flatter organization based on task oriented groups is the most effective structure for the information superiority environment. A potential organization structure is recommended along with further study in this area to best achieve unity of effort, interoperability, and agility from the operational level organization.

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Organizational Change for Improved C2 in the Information Age

by

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CDR   USN

**A paper submitted to the Faculty of the Naval War College in partial satisfaction of the
requirements of the Department of Joint Military Operations.**

**The contents of this paper reflect my own personal views and are not necessarily endorsed
by the Naval War College or the Department of the Navy.**

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Abstract

Information superiority is a capability present today and expected to continue in the future. This capability provides information at faster rates increasing situational awareness, enhancing information sharing, and increasing the speed of decision making. The advantages of this information rich environment are not optimized because the users of information reside in an industrial age organizational structure. The command and control function within the organization is addressed. This paper defines effective command and control elements and applies these terms to recent military operations. The solutions to similar C2 problems from the corporate world are analyzed. Finally, the paper evaluates the examples and concludes a smaller and flatter organization based on task oriented groups is the most effective structure for the information superiority environment. A potential organization structure is recommended along with further study in this area to best achieve unity of effort, interoperability, and agility from the operational level organization.

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With exponentially exploding technology in weapons and our ability to process information, the ability to optimize the command and control structure will take on even greater importance.
General C.C. Krulak (Ret.)

<u>Introduction</u>

Secretary of Defense Donald Rumsfeld, in 2001, directed combatant commands establish a Standing Joint Force Headquarters (SJFHQ). In a December 2003 memo, he reiterated that a SJFHQ is *an important step* in increasing the ability to respond to… the global security environment.[1] This organizational change is an *important step* but it is just an initial step to optimize command and control (C2) at the operational level.

Information superiority, information technology, and network-centric warfare are related terms for the capabilities generating unprecedented speed in which the military gains, processes, and acts on information. The capability present today and the improved capability expected in the future provide information superiority or the "…uninterrupted flow of information while exploiting or denying an adversary's ability to do the same".[2] The United States has a significant investment in this technology. This investment provides the commander more information at faster rates increasing situational understanding, enhancing information sharing, and increasing the speed of decision making.[3] Despite the technological improvements, the users of information reside in an industrial age organizational structure that is not optimized for interoperability and agility.[4]

The organizational structure, specifically in terms of command and control, can be optimized by a smaller, flatter organization. This structure has reduced size, less vertical hierarchy, and increased horizontal information flow. A smaller, flatter organization will increase decision speed and agility. This paper explores recent examples of organizations not synchronizing joint force command and control (C2) functions. Similar C2 organizational

problems have occurred in business. This paper will explore the solutions business used to overcome their problems. From these examples an analysis will show the command and control structure is better suited for today's information superiority environment by a smaller and more horizontal command.

Command and Control

Command and control ties together all the operational functions and tasks and applies to all levels of war and echelons of command across the range of military operations.[5] The importance of C2 cannot be taken for granted. Nothing is so important in war as an undivided command.[6] C2 is such an underlying function that it is addressed in 90% of the Joint War fighting publications.[7] The tenets of C2 are listed in Joint Publication 0-2. These tenets are the principles that provide strong C2. I summarize these tenets into three basic elements. These basic elements are appropriate/orchestrated means (unity of effort), interoperability, and agility.[8]

Command and control is a process. It is a series of steps that attempts to synchronize events in time, space, and between forces to achieve a defined objective. The process, to be effective, requires unity of effort. Unity of effort means considering military, diplomatic, economic, and informational contributions in order to develop synergy to achieve objectives. In the contemporary period, the problem more frequently is how to discipline the available power into some relationship to the objectives likely in dispute.[9] The ability to discipline available power, or generate unity of effort, has become increasingly difficult when operating with joint forces, coalition forces, and the interagency.

Another element of C2 is interoperability. Interoperability allows all groups within an organization to coordinate, integrate, and flow information to all users. Goldwater-Nichols

was established to encourage the separate services to increase interoperability and work together in the battle space.[10] Information superiority makes data available and interoperability allows free and full exchange of data. September 11, 2001 was a result of lack of information sharing and analytical synthesis.[11] This attack demonstrates the importance of interoperability.

The last element of C2 is agility. Agility has many closely related names including flexibility, speed, innovativeness, and adaptability. An agile organization can respond to changes or unexpected circumstances. Agility is of paramount importance in an uncertain world.[12] A world where today's operating environment includes urban operations, stability, security, transition, and reconstruction (SSTR), and humanitarian assistance and disaster relief (HA/DR) efforts. In this environment, responsiveness and agility are fast becoming the critical attributes for organizations.[13]

These basic C2 elements are the framework to be used in the analysis of the lessons learned from recent military operations. I will provide four examples from real world operations over the last five years. These examples illustrate the failures of the organization to achieve the basic elements of C2.

Military Command and Control Lessons Learned

Operation Anaconda is the first example. Operation Anaconda occurred from 2-16 March 2002 with a goal to clear the Knowst-Gardez region of al-Qaeda and Taliban forces. The CONOPS called for a short duration "non-linear simultaneous operation in noncontiguous areas of operations".[14]

The established organization was a Combined Joint Task Force (CJTF). A typical CJTF as defined in Joint Publication 5-00.2.[15] The Combined Joint Forces Land Component

Command (CJFLCC) formed only a few months prior to this operation. CJFLCC was formed because the next phase of the conflict in Afghanistan included land operations.

Planning started in early January of 2002. CJFLCC and special operating forces (SOF) were coordinating inputs. Initially, Operation Anaconda was a SOF mission. The operation soon became larger than just a SOF operation. CJFLCC took charge of the planning. The planning process was stove piped that coordination across functional areas did not occur. "I think that's where the ball was dropped first," General Moseley, the Combined Forces Air Component Commander (CFACC) commented. "I don't think the CFLCC knew what this thing was growing into, and I don't believe the CINC staff knew what it was growing into," he said.[16]

Several areas of planning lacked coordination. The plan required significant close air support, yet the Combine Joint Forces Air Component Commander (CJFACC) never knew of the plan until five days before it was set to occur.[17] The operational commander, JTF *Mountain*, believed civil affairs/humanitarian operations would quickly follow but the coordination for these events did not occur. Stove piped communications prevented sufficient intelligence coordination. General Hagenbeck, Commander of the 10th Mountain Division, said, "We only probably had about 50% of the intelligence right."[18]

Other organizational issues occurred just prior to execution. The first was the establishment of CJFLCC-FWD. The "normal" information flow path was interrupted. CFJLCC-FWD maintained control for planning but the move lead to confusion about which organization, CFLCC or CFLCC-FWD, was coordinating plans. The second issue was the late acknowledgement that operations would be conducted in support of Afghan forces. The final issue was integrating forces involved due to the close proximity of operations.

This operation is generally considered a success but some of the C2 problems did slow the results and ultimately led to more U.S. casualties. Interoperability was the significant factor. As General Moseley put it, "the silver bullet for Anaconda is better orchestration at the component level".[19] What was lacking was a free and full exchange of information or interoperability.[20] This raises the question of whether the component commander should force clear ties. The ties might be "flat" from component to component.[21]

A second example was Operation Unified Assistance, the Southeast Asia tsunami relieve effort. Combined Support Force (CSF 536) (III MEF) led this operation. This organization differed slightly from Operation Anaconda but still maintained component commands. The lessons learned identified several C2 areas for improvement. Some of these areas include clarifying relationships between Multinational Planning Augmentation Teams and the SJFHQ, developing communicating procedures, refining coordination procedures, and the coordination of "capabilities packages".[22] The capability package is the focus of this evaluation.

Personnel recovery is the "capability package" at issue. The personnel recovery capability was not well organized or coordinated through most of OUA. CSF 536 designated CFACC (Hickam AFB, HI) as the Personnel Recovery Coordinator (PRC). The concept was to activate the Pacific Rescue Center as the Combined Personnel Recovery Center (CPRC). CFACC was incorrectly designated as Joint Personnel Recovery Agency (JPRA). The correct designation should have been Joint Search and Rescue Center (JSRC). Confusion and several other miscommunications delayed activation of the CPRC until day 16. Official coordination modes were not established until Day 17. CFMCC operated Self-SAR/Recovery within the Relief Operating Area (ROA). CFACC and CFMCC lacked coordination across their

functional areas delaying efforts to find isolated personnel, authenticate their identities, and return them to their proper authorities.[23]

This case highlighted degradation in all elements of C2. The CFMCC/CFACC hierarchy developed seams between functional components. These seams create gaps in roles and responsibilities that lead to lack of accountability for interoperability, information sharing, and collaboration.[24] CFMCC collaboration with CPRC did not occur. Information sharing from CSF to its components and across components lacked interoperability. The organizational structure was a source of conflict that did not allow unity of effort.

Controlling authority is the focus of the third example. This case is the fight for Baghdad during Operating Iraqi Freedom. Army and Marine forces were assigned to CFLCC. CFLCC had operational control (OPCON) of Army V Corps. OPCON provides the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission.[25] I MEF was TACON to CFLCC which didn't allow for reorganization of forces.

The OPCON/TACON relationship impacted operations when V Corp and I MEF entered Baghdad. CFLCC was unable to reorganize I MEF and transfer forces through portions of V Corps due to the TACON relationship. This relationship reduced CFLCC flexibility to adapt to the quickly changing environment. Instead of an integrated joint force entering Baghdad, CFLCC split the city to east and west sectors.[26] These sectors were then fought in a non-integrated fashion with the Army taking the west sector and the Marines fighting in the east sector.

For military operations, the ideal reporting relation is "flat and clear" because it permits rapid response.[27] This layout encourages spontaneous interaction shown under cooperation to maximize contribution of all elements.[28] The OPCON/TACON relationship did not support cooperation in the emerging battle space. The control relationship prevented agility and responsiveness necessary for the situation. If a supported/supporting relationship were utilized, agility could have been maintained. Doctrine and rigid organizational controls impacted the effort in Baghdad. This command relationship limited span of control, full integration, and coordination of force (unity of effort).

The last example is at the combatant command (COCOM) level. COCOM's are elements that relate to U.S. national strategy and operational activities within the theater.[29] In this case, the operational aspect of the COCOM will be examined. European Command (EUCOM) and Central Command (CENTCOM) coordination issues are the central problem. In Operation Iraqi Freedom (OIF), EUCOM was in a supporting relationship to CENTCOM. In that capacity, it coordinated the political-military issues in order for U.S. forces to enter northern Iraq through Turkey. CENTCOM and EUCOM staffs conducted nearly identical actions to establish the conditions for the operational plan.[30] The supported/supporting relationship, without unity of effort and interoperability, created significant duplicative effort.

This example illustrates C2 issues at the combatant command level. All C2 elements were impacted. Unity of effort did not occur with duplicative action to gain access to Turkey. Information flow across the geographical regions led to the breakdown of interoperability. In this larger span of control, the gap in integration between the two commands forced Turkey to respond to two different combatant commands.

Significance of Evaluated Cases

Since each of the previous examples was a success, why are these cases of any significance? Several reasons make these cases significant. Information superiority was established in each case. The forces retained full and uninterrupted flow of information and was never denied communications or sources of information. These events were based on recent history and are relevant in current global operations. The organizational structures reflect joint doctrine. In certain cases, time was a factor and other cases sufficient time was available for planning. Yet, even under established organizational structure and joint doctrine, enough significant issues developed reducing efficiency, costing American lives, and potentially jeopardizing portions of or entire operations.

Another significant feature of these examples is the implication to current and future operations. Operation Anaconda was a large battle but one operation in the larger Afghanistan conflict. Conflicts of this size are more likely to occur than major combat operations against a peer competitor. Operation Unified Assistance was a quick reaction relief effort that showcases the goodwill of the United States. Hurricane Katrina and Pakistan earthquake relief efforts are additional examples of the repeating nature of humanitarian assistance and disaster relief (HA/DR). Global war on terrorism continues and spans across many geographical locations. The seams between geographical combatant commanders continue to become blurred. The control of forces, as in Baghdad, becomes increasing important as the U.S. fights in urban areas or conducts stability, security, transition, and reconstruction operations (SSTR). The choice of examples exemplifies the expected operations now and in the foreseeable future.

Today's environment requires all elements of C2. The United States holds the advantage in technology and information superiority in each analyzed example. The enemy, whether a terrorist organization or state actor, will seek increased capabilities, including using technology to improve their decision processes. These facts make seamless C2 a necessity and not "something to work through". Now is the time to improve our organization for greater efficiency in this era of information superiority.

Corporate C2 Organizational Problems

Are there examples that can answer the organizational question? Corporations or business is the first place to look for a solution. The similarities between business and the military make them an ideal choice to evaluate organizational change. Business has global reach. Corporations span across many countries and conduct varied operations. The organizational structure of business evolved from the same type of structure the military uses now. Technology influences business operations. Speed and access to information forced business transformation similarly to how information is transforming the military. Business as an entity rivals the sheer size of the military.

The assertion that "what is good for business is good for DoD" is a dangerous oversimplification. However, the converse assertion that "lessons learned in the commercial sector have no application to the domain of warfare is equally untrue and if believed would deny us an opportunity to learn from the experience of others.[31] The problems facing business do have application to the military. Specifically, organizational examples provide many crossovers between business and the military. These business examples will be described and related to the military lessons learned. After the last example, an analysis of

the common aspects of the business solutions will provide insight to the potential organizational changes.

Asea-Brown-Boveri (ABB) is the first company organization. Their organizational issue equates to the Operation Anaconda. Operation Anaconda's organization was a JTF with functional components. The C2 problem was lack of information flow in the horizontal and vertical chains of command.

ABB, a European based firm, is one of the leading producers of power generation equipment, factory automation systems, robotics and machine tools, high-speed trains, and environmental monitoring systems.[32] In the late 1980's and early 1990's, ABB acquired numerous companies expanding its core businesses. Rapid expansion created a dilemma. ABB leaders faced pressure to balance low-cost production with fast response to local markets.[33]

Their problem was similar to Operation Anaconda. Their separate business functions slowed response. Communication from the product lines to corporate headquarters (vertically) and across functional/product lines to the numerous local market managers (horizontally) was lacking. Just as in Operation Anaconda, all three elements of C2 were minimized. ABB's solution was a matrix organization.

The matrix organization essentially forced a product line or function to report to two bosses. The vertical boss, production manager (CFLCC), coordinated operations within the functional area. The horizontal boss, country manager (CFLCC-CFMCC-CFACC), managed the efforts in the local markets. This structure reduced the size of the organization but addressed the interoperability and unity of effort concerns.

Kodak is the next company and this example corresponds to Operation Unified Assistance. OUA lacked orchestration from not understanding proper terminology, slowness to react, and coordination problems. In the mid-90's, Kodak wanted to reinvigorate its black and white film division that had many similar C2 issues. They made several organization changes to invigorate this core functions.

Similar to the personnel recovery example, black and white film is a core but small/niche process. Kodak evaluated this process and noted inefficient work rules and obsolete procedures.[34] Their solution was "Team Zebra". This team centered on the process to reduce inefficiency and dysfunction.[35] They focused to understand the current environment and technology. Then the team determined best practices to reduce cycle-time, on-time delivery, customer service, and other processes. Kodak reduced its size and used a streamlined effort based on core groups with a greater knowledge base to work across all aspects of a process.

Corning Corporation provides a third example. Corning's problem was its inability to take advantage of newly emerging technologies.[36] Corning's product divisions were unable to support each other due to a rigidly delineated vertical boundary. This inability to flow information slowed their responses in a fast changing environment. A product division required "reach back" to corporate for cross communications. Reach back rarely resulted in positive information flow. Corning's hierarchical product lines did not provide unity of effort, interoperability, or most importantly agility. Agility was the issue from the OPCON/TACON relationship in the fight for Baghdad. This example, as well as the Baghdad example, demonstrates how entities of close functionality are unable to support one another because of a rigid control process.

Corning used a change in doctrine to solve its problem. The organization (product line) remained the same but they developed semi-permeable boundaries between products.[37] A semi-permeable boundary removes formal processes allowing greater information flow resulting in greater flexibility. This doctrine effectively flattened the organization generating greater cross communications.

Ford Motor Company parallels the EUCOM-CENTCOM seam issue. Ford, over the last four decades, organized in a geographic division structure. Its geographic divisions independently conduct development, manufacturing and selling. Over the course of 40 years, a large fraction of their operations became incompatible between divisions including parts, innovations didn't translate across regions, and duplication of effort was rampant. [38]

Japanese competition forced Ford to change to a product line vice a geographical organization. The goal was greater interoperability to reduce duplication. The process of vehicle manufacturing took precedence over resolving minor vehicle differences based on geographic location. Those differences were now sorted in the production divisions. The elimination of duplication shrank the organization but increased its unity of effort and interoperability.

Corporate Solutions

Each solution was slightly different. Solutions ranged from flattening the organization by opening up boundaries to eliminating entire geographic division structures. The key concept each solution emphasized was the core task. Business simplified their organizations to gain C2 efficiencies. These efficiencies produced unity of effort, interoperability, and agility for the processes related to a specific core competency.

The organizational changes addressed C2 elements. Semi-permeable boundaries improved interoperability through better communications, information flow, and coordination. The matrix organization reduced a layer of structure but increased unity of effort with improved integration and coordination. "Zebra Teams" boosted all elements of C2 by eliminating most echelons, and incorporating the entire information flow, communication, integration, and coordination with a single group. Business simplified their structure to focus on process efficiency.

Do the varied product lines that business conducts translate to the varied operations conducted by the military? A report to Congress in 2000 noted network centric warfare is no less the embodiment of information age technology in DOD. For this reason, a business model based on these characteristics is ideal for an information age military. It's a military business model that attempts to create competitive advantage.[39] The answer lies in the key concept of the business solution – emphasis on the core task/process. Military operations focus on objectives, missions, or tasks. These are goals that include a series of processes leading to a desired outcome. Therefore, the solutions developed by business can be used as organizational models for the military with emphasis placed on the core tasks or processes.

The solution set generated by the business cases more efficiently conduct the C2 process (unity of effort). The military structures, whether functional component, geographical command, or service components, place rigidity in the organization causing the exhibited situations. The solutions are to break the rigid structure and introduce flexibility by opening the doors for information flow. Information flow fosters integration, coordination, communication, and eventually unity of effort.

The solution set showed the process matters not the formal structure. C2 is about the necessary and sufficient conditions for success in military operations, not how they were or are accomplished.[40] Many solutions centered on small teams with increased horizontal type integration that spans many functions of the business. In other words, the solutions tended to make the organization smaller and flatter.

Recommendations

> *New conditions require…new and imaginative methods.*
> *Wars are never won in the past.*
> General Douglas MacArthur

Commanders must insist that streamlining of military structures occurs. Hierarchical structures are inefficient for the environment envisioned and must be eliminated.[41] The breakdown in C2 occurred despite an established organizational structure and explicit joint doctrine. The results of this research lead to two recommendations. The first recommendation is a proposed organization based on the concepts from the business solution. The second recommendation is further study and implementation of organizational change to reap the benefits of information superiority and information technology.

The guiding principle business followed was to shrink the management and focus on the task. General Zinni recognized that the commander needs only a few staff sections in order to command and control in the low threat missions.[42] His CENTCOM staff was a layered organization. The first layer was his few key inner circle advisors. The next layer was the supporting leaders to his key advisors. The final layer was selected cells based on specific tasks.[43] General Zinni identified about 100 integrated staff cells the JTF Commander can select from and establish in theater for specific tasks.[44] The idea was minimize layers of staff and, when required, form a group that runs a specific task across all functional areas.

The task cell organization is a flat structure as shown in figure 1.[45]   This structure is a

visualization of General Zinni's model. Under the combatant commander, the SJFHQ

structure exists. Additional joint task forces can be created based on the current world

situation. The SJFHQ will be the nucleus for all operations in the combatant commanders'

area of operations.

The SJFHQ will integrate air, land, maritime, information, and other civil and military

operations on a day to day basis. As in General Zinni's model, new task oriented cells can be

formed to develop solutions to specific tasks or missions. Interoperability is maintained since

the cell crosses all functions. Agility is maintained since the cells are established from within

the organization and they understand the specific events and personnel in the organization.

Finally unity of effort is maintained by a simplified structure that focuses on the task and

reports to a single boss.

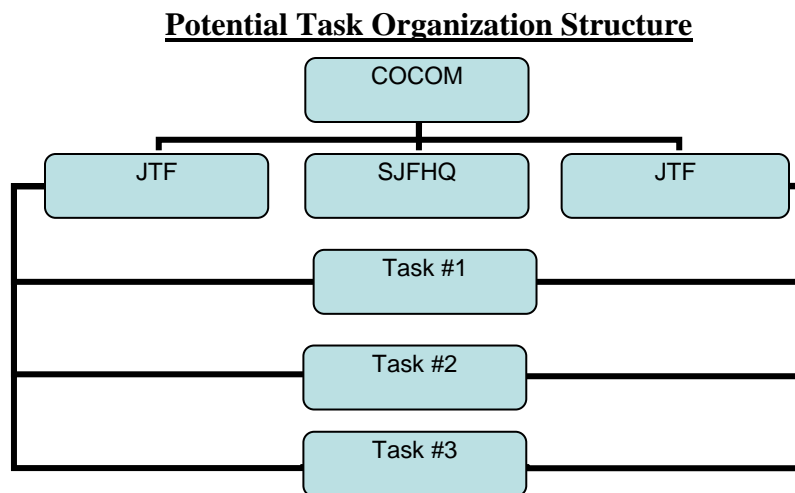**Potential Task Organization Structure**

Fig. 1

Vice Admiral Edmund P. Giambastiani, Jr. stated before the House Armed Services

Committee that essential to the power of adaptive planning and execution is our ability to

conduct large scale, vertical and horizontal collaboration.[46] This structure is a potential

option to develop interoperability or large scale collaboration. This structure is only one

option. The Joint Forces Command (JFCOM) also recognized that the structure below the combatant command should be reevaluated. They recommended reviewing the structure and balance of service headquarters.[47]

The results of this paper, as corroborated by the JFCOM lessons learned, enforce the necessity of the second recommendation. This recommendation is further analysis and evaluation of improving the organizational structure for command and control. Information superiority and the technology that supports it is a focal point for both business and the military. Yet the focus of C2 on any organizational level should be the human element, not the technology that supports it.[48] The SJFHQ was an organizational step that was not too radical to implement. Further studies on this topic will have the challenge of preserving the existing infrastructure while developing the next generation of doctrine.[49]

Conclusion

Information superiority provides the commander unprecedented access and amount of information. Uninterrupted access to information and communications occurs today and is an expected condition in the future. This level of information access has the potential to reduce decision time, provide all levels of command situational awareness, and provide the commander the advantage in the information warfare battlefield. The problem is the users of information reside in a structure not designed to efficiently utilize information superiority.

A smaller, flatter organization provides the users of information unity of effort, interoperability, and agility. The military lessons learned demonstrated that even with established structures and doctrine, the current organization is too cumbersome to be efficient. Business had similar situations and their solutions were the insight into how a smaller, flatter organization can solve information flow problems.

The solution is a focus on the task or mission. The organization that simplifies its structure and emphasizes the task with small coordinated groups can effectively use available information. A potential new organization was presented based the business solutions concept. This organization was smaller and provided the means for greater horizontal flow of information.

This paper has shown that a smaller and flatter structure has a great potential to improve the C2 process. The developed organization is only one potential solution. Additional study and evaluation needs to be conducted but a change is essential to fully utilize the military in the information superiority age.

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